

Peyote (sometimes called mescal buttons) is the dried flowering tops of the peyote cactus (Lophophora ~~alamosii~~ or Lophophora lewinii), a small low-growing plant which grows abundantly in the valley of the Rio Grande in the southwest portion of the United States and the adjacent parts of Mexico.

The peyote buttons are from an inch to an inch and a half in diameter, about one-fourth or three-eighths inches in thickness, with a convex undersurface. The button is hard when dry and becomes soft when moistened. Reports on file state that it has a very bitter, unpleasant taste and an odor when moist which is peculiar and disagreeable; also that the odor is especially noticeable in the powdered drug. It appears that the root is sometimes used by the Indians, but the top (just above the root) is preferred and is the part most generally used.

The commercial name in English for this drug is pe-yo-te, which is an adapted form of the Spanish spelling pe-llo-te, which according to the Mexican variation in pronunciation is called pe-yo-te, although always written in Spanish pellote. The name is of Aztec origin. Another name for the plant is Anholanium or Anhalonium lewinii.

It might be well to mention that while the name "mescal" is very commonly given to peyote as now under consideration, the term "mescal" is also applied (and more correctly) to a distilled intoxicating liquor derived from an entirely different plant.

The use of peyote by Indians was learned from the Mexicans. It was used as a medicine and for the experiences which followed the chewing of this cactus. Once used the Indian naturally desired to experience again the strange feelings and emotions which it produced, so that very frequently the peyote habit became formed and the Indians became slaves to this drug habit similar to those who use cocaine or other drugs or whiskey and other intoxicants. The effect produced by the use of peyote appears to partake of the nature of both opiates and intoxicants, and scientists who have analyzed it report that it is an article which is very dangerous to the health and welfare of the people.

Effect of Peyote on Indians.

It has been contended that peyote is not injurious to Indians; that it is a medicine, etc., and splendid examples of Indian manhood and womanhood have been exhibited as alleged living examples of the harmlessness of the use of peyote.

Naturally those who use the drug, and those who promote its use for financial or other reasons, will pick out for such exhibit the best specimens they can find and of course pick out those apparently not yet injured by the dangerous drug.

But the scientific reports show that peyote contains dangerous drugs which have a deleterious effect upon the human system. Such an article should not be allowed to be used indiscriminately, but should be placed under such restrictions that it will be available for scientific medicine and not for general unrestricted use.

Aside, however, from the scientific proof of the dangerous character of peyote, we have a great many letters and petitions and appeals in our files which show that peyote has actually been a serious menace to the life, health, mentality, vigor, etc., of the Indians to such an alarming extent that the Government may some day be charged as being criminally negligent for not having taken preventive measures sooner to protect the Indian from this great evil.

Reports of superintendents in charge of Indians, Indian Service physicians, farmers, field matrons, missionaries, and others who actually live for any length of time among Indians who use peyote are almost unanimous in stating that peyote is harmful mentally, physically, and industrially. Of course, there are some who have not observed the harmful effects.

Attention is invited to a few extracts from these reports relative to peyote:

Dr. H. R. Hummer, Canton Indian Insane Asylum.-- "This is a poison, producing an intoxication actively detrimental to health. It should be condemned."

Dr. E. E. Hart, Government Physician, Cantonment Agency, Oklahoma, 1919.-- "The effect on those who attend (peyote feasts) is that of general depression, followed by idleness and laziness."

Supt. R. E. L. Daniel, Cantonment Agency, Oklahoma, 1919.-- "Its excessive use undoubtedly retards moral development and causes moral degeneracy. Its physical and mental effect is the natural result of a powerful narcotic which produces general paralysis of the nervous system. * * *. It does intoxicate * * *. Those who have the 'habit' are indolent, shiftless, have no fixed purpose, are devoid of all sense of responsibility, won't work, and spend their time traveling from camp to camp, living upon the fruits of their friends' labor."

J. L. Johnson, farmer, Cantonment Agency, Oklahoma.-- "They roast the peyote, stew it, and drink the tea; also eat it raw. The effect is a derangement of the physical make-up; it acts as a stimulant for a short time, then the victim becomes morbid, quarrelsome, stubborn, and very disagreeable to handle; finally, if they have a plenty of this poison in their system, they fall asleep. I have been at the place after their feasts are over, and I find that they are sleepy, stupid, wild looking, and hard to make understand the simplest language. The Indians that are addicted to the habit of peyote are less industrious than those that do not use it extensively * * *. It seems as though the young single men are the worst about peyote, as I believe it excites the passions."

T. J. Davis, a missionary to the Cheyenne Indians in Oklahoma, says: "They (the Indians) want to use it like whites use whiskey. * * * Ralph Williams' child and many others (injured by peyote). Chief Roman Nose took it, went to sleep and never woke -- died a healthy man. John, his son, told me, 'Peyote

killed my father.' They use it just like the white people use whiskey. They also give it for all kinds of sickness. The Indians that use lots of peyote, it so stupefies and runs the system down that they take tuberculosis or any other disease easily, and have small resisting power."

Rev. F. L. King, Missionary, Watonga, Okla., says:-- "I regard the use of peyote as the gratification of a desire for the physical effect of the drug on the body."

Supt. H. P. Marble:-- "I would not class it as an intoxication, but rather as a stupefaction."

W. E. Donner, Principal, Euchee Boarding School:-- "The effect is quite similar to morphine when used as a drug habit. Hallucinations and dreams, are characteristic of its effects. It causes a form of intoxication if used in large quantities. The users are not as industrious nor as thrifty as non-users. They are viewed, by non-users in the same way teetotalers view drunkards. * * *. The growing use of peyote is deplored by the progressive element in the tribe. Members have expressed a wish for its use to be prohibited and the law enforced rigidly against it."

Supt. W. E. Dunn, in charge of the Winnebago Indians in Wisconsin, says:-- "With many who use peyote, or mescal, there is every symptom of intoxication and this continues for some days and the victim does not seem to be under any moral restraint whatever. The mental effect is stupefying and the continued use weakens the mentality, and, I believe, two Winnebago Indians will soon dethrone their reason. The physical effect is a tendency to stop the organic functions and especially weakens the heart action as did the 'flu' * * *. Those who use mescal to excess are far less industrious and advanced than those who do not use any stimulants." (The "mescal" referred to herein is the peyote button.)

Supt. Bonnin, Kickapoo School (1919), says:-- "Where it is used to excess its effect seems to produce an exaggerated vision, weakens their power to resist immoral practices, and their constitution. They appear to be in a state of lethargy when talking to a person. The users of peyote at this agency are mostly returned students who have just learned its use from other tribes. I have one user in mind who is more industrious and thrifty than all the rest, but he appears to be an exception. The majority of them are shiftless and do very little towards self-support. They do not appear to have much ambition."

Supt. C. V. Stinchecum, Kiowa Agency (1919), says:-- "It does, in my opinion, cause intoxication; and its effect from a mental, moral, and physical standpoint is disastrous to its users. A great many cases of illegitimacy are traced directly to the peyote feasts. As a whole, the Indians who use it are less industrious than those who do not. Of course, there are exceptions to the rule, but the exceptions are very few."

Rev. Richard H. Harper, a missionary, of the Kiowa and Comanche Agency, in answer to a question as to the moral effect of peyote, gave several specific quotations from peyote users and former peyote users and examples of its evil moral effect and sums up saying:--"We are thoroughly convinced that the use of peyote leads to immorality sexually. Given: A drug which stimulates the sexual passions,

and, at the same time decreases the will power as to resistance, and the inevitable result is immorality in action."

Conditions connected with the peyote "feasts" or "meetings" are conducive to loose morals. Mr. Harper also gives the testimony of a number of Indians relative to the bad, mental, physical, and moral effect of peyote.

Rev. H. H. Clause, Mountain View, Okla. (Kiowa), referring to peyote, says:-- "A curse that is fourfold in its effects: financial, physical, mental, and moral. There is not one single good in the business. Young men that the Government has spent thousands of dollars to educate are made almost worthless by this spreading curse. It is on the increase in this tribe, and spreading to other tribes. If there is not a strong law against it, it will be the ruin of what the Government is doing for the Indians. The plea that it is a religion has no force; any Government has the right to stop a religion that is producing the ruin of its citizens. If men would sing and pray over their beer, it would be the same thing that these people are doing. It must be one of two ways: stop it, or leave the Indian in this way of destruction. Twenty-three years among these people, I know what I am talking about."

Many other extracts might be taken from the reports on file showing beyond the shadow of a doubt that the use of peyote is a serious demoralizing factor in the lives of Indians in those jurisdictions where the vicious habit has been introduced. There are a number of jurisdictions where the peyote habit has not been introduced, and it is hoped legislation may soon be secured which will check the spread thereof.

Numerous citations might also be given as to the filthy and degrading way in which peyote is sometimes applied when used as a medicine, such as chewing the buttons and expectorating the juice on the naked bodies of men, women, and children, including new-born infants-- even expectorating the juice into the mouths of sick babies or pouring peyote tea into the mouths of the sick.

The files of the Office contain requests and petitions of peyote users that they may be permitted to continue using same. The files also contain requests and petitions from individual Indians, from tribal councils, and from numbers of Indians, who, seeing the evils of peyote and its debauching and demoralizing tendencies, have appealed to this Office, to members of Congress, and to the President to stop the sale, use, etc., of this destructive article.

It may be noted here that those spreading the peyote propaganda seem to be organized and able to employ legal assistance, while those appealing against it do so largely as individuals and without any organization. Indians giving information about the evils connected with the peyote meetings have asked that their names be withheld as the peyote users had mobbed and threatened those who exposed their secret motives and the evil side of their meetings.

It is also difficult for white investigators to ascertain the actual conditions from personal visits to these feasts. In the presence of such visitors the meetings are conducted as if they were of real religious significance, and without the more objectionable features, but left to themselves and in many cases, there is little religion in them and the real object is the gratification of the desire for meetings, and the experiences and privileges thereto appertaining, which of course, vary largely in purpose and practice. Information, however,

has been received particularly in regard to a peyote meeting, or meeting attended by a certain scientist of this city where the peyote leaders set the stage cleverly to show a religious feast. It is assumed that the scientist was not and probably is not yet aware of the fact that the meeting he attended was not the meeting that is frequently held and which the Indians carry out when they have no telltale visitors. Persons occasionally or spasmodically visiting among the Indians can not learn the secrets of the inner workings of the various meetings, but persons who actually spend years among them in the capacity of missionaries and Government employees gradually pick up the threads from time to time from Indians themselves when times come causing the voluntary revealing of information which could not be obtained in a direct inquisition.

This brings up the question as to the religious significance of peyote and the peyote feasts. While it may easily be assumed that some, even many Indians have been led to believe that peyote is itself of religious significance through its having been used at religious meetings, the preponderance of evidence in the reports received is to the effect that peyote is a non-essential element in the religion of any of the Indian tribes as tribes, and especially as being their ancient and regular form of worship.

To this day there are many Indian tribes to whom the peyote has not been introduced at all as a religious rite. It is true that peyote promoters are spreading its use as rapidly as possible, but on more than one occasion it has been found that the party introducing peyote into a reservation is a fraud and an imposter without religious principles.

On a number of reservations where peyote is now used, its introduction can be traced back to a comparative recent or very recent origin and it frequently appears that it was introduced as a habit rather than as a religion.

Many reports from Indians as well as from the missionaries and our own field force state emphatically that the claim of religion is but a cloak by which to attempt to protect the use of a deleterious article which they realize is soon to be forbidden.

As to those Indians who believe in their religious ceremonies connected with peyote meetings, a number of reports point out that the peyote itself is only an incident. It is probably a general rule that when the Indians held a feast or a dance or some other tribal gathering they had a ceremonial performance and they frequently attached a religious significance to the ceremony whatever it was. Likewise when peyote was introduced into a meeting, its use grew into a ceremonial formula; but the peyote was merely an incident in the ceremonial habits and customs of the Indians. It has been necessary to forbid many of the old Indian dances which had connected with them ceremonial cruelties and injurious or immoral practices which were performed with a certain amount of "religious" significance according to their customs. Such "religious" significance, however, is hardly to be placed in the same category as a genuine religious faith, as the word religion is rather improperly used to describe what is simply a custom or habit of a people.

Promoters of peyote do now frequently attempt to connect the use of peyote with a religion and even with the Christian religion. As indicative of the fact, however, that this is a recent attempt to tack peyote unto religion for whatever protection religion may give it, and as proving that the custom is not an "ancient and native religious rite and custom of the North American Indians" generally (or even locally), it has been found that at and incident to peyote meetings as actually conducted, there is frequently gambling, intoxication, sexual licentiousness, filthy habits and practices, etc., which were not intended by the Indians as religious ceremonies--Christian or otherwise-- and which can not be accepted or tolerated by civilized people or by this Government.

The very fact that the peyote promoters have attempted to graft peyote worship on the Christian religion or to graft the Christian religion on the use of peyote in their tribal meetings or feasts is strong evidence that the claim of religion is but a cloak to throw around the use of peyote, as no copy of the Christian's Bible contains any reference to peyote or its use so far as I am aware. Further, the evidence of the effect of peyote is directly contrary to the teachings and principles of the Christian religion, and it is hardly believed that sincere people will be fooled by the allegations of "religious sacraments" in behalf of this dangerous drug.

In a recent health report of Dr. R. E. L. Newberne on the Omaha reservation, wherein he noted the ravages of the peyote habit, he very aptly said:

"The problems of caring for the orphans and the old people must be met sooner or later. Many of the parents are addicted to the use of peyote and die before their children are old enough to provide for themselves -- die and probably leave their own parents who belonged to a generation that never acquired the peyote habit and their own children to whom perhaps they taught it."

From Dr. J. J. Bergmans, a physician and surgeon at Taos, New Mexico, in which he informed the Office of a special council meeting of the principals of the Indian Pueblos of Taos called for the purpose of taking some action to suppress the new and growing evil of peyote, he said:

"The users of it (peyote) are people who will sell their produce and other belongings in order to acquire peyote. They are becoming more and more neglectful and shiftless, even at times mentally unbalanced, and the other Indians see with alarm how they eventually will become paupers and a burden to the community."

The States of Colorado, Kansas, Utah, Nevada, and South Dakota have already enacted laws prohibiting the sale, etc., of peyote.

The Indian Bureau firmly believes that Congress should take early action to protect the Indians from the insidious effect of this drug.

Appended hereto are copies of reports, etc., of scientists and others who have made analyses and tests of peyote or who have had special opportunity to observe its effects.

EXHIBIT A.

MESCAL.

(By E. B. Putt.)

"Mescal" is a term applied to a drug obtained from the tops of certain species of cacti grown in the valley of the Rio Grande in Mexico. The most important of these species are anhalonium Lewinii and anhalonium Williamsii. According to Coulter, these should be referred, not to Anhalonium but to the Lophophora species. Hence, the above appear in Coulter's classification as Lophophora Lewinii and Lophophora Williamsii, respectively.

The word "mescal" should not be confused with a similar term which is applied to a distilled liquor prepared by distillation of the fermented juice of several species of agave (Agave American, L.) grown in Mexico. The above juice before distillation is called "pulque" (V.U.S. Disp. 19th ed.)

Mescal was first investigated from a chemical standpoint by Lewin in 1888, who separated what he considered to be the alkaloid anhalonine. Heffter, in 1896, made a further investigation of this drug and obtained, in addition to anhalonine, three alkaloids, viz, mescaline, anhalonidine, and lophophorine.

In 1899 E. Kauder made a thorough investigation of mescal in the laboratories of E. Merck at Darmstadt. That work was very complete, and a full account of the investigation appeared in the Archiv der Pharmacie for 1899, volume 237. He reports the following percentage of alkaloids obtained from mescal: Mescaline sulphate cryst., 0.9 per cent; anhalonine hydrochloride cryst., 0.25 per cent; pelletin hydrochloride cryst., 0.2 per cent; anhalonidine hydrochloride cryst., 0.2 per cent; anhalamine pure cryst., (?) per cent.

The method employed by Kauder in separating the above constituents was used by the writer for the purpose of ascertaining, if possible, which alkaloids are responsible for the peculiar effects attributed to the drug. Kauder's method consists essentially of the following: The drug is first extracted with alcohol, the extract freed from fat, made alkaline with ammonia water, and the alkaloids shaken out with chloroform. The alkaloids dissolve in the chloroform layer and a resin-like residue is left undissolved. This chloroform extract is then shaken out with acidulated water and the alkaloids removed as sulphates. These are again thrown out with ammonia and extracted first with ether and then with chloroform. The ether solution yields, according to Kauder, the alkaloids anhalonine, pelletine and lophophorine. The chloroform solution yields mescaline, anhalonidine, and a new alkaloid--anhalamine. Owing to the limited time at the disposal of the writer, no attempt was made to effect a complete separation of the above constituents except that necessary to establish the identity of the extracts obtained.

The drug was reduced to a coarse powder by means of a drug mill and extracted in soxhlet with ether and with chloroform. Another portion was extracted by continuous percolation with 70 per cent alcohol and a fluid extract thus obtained of U.S.P. strength, i.e., 1 cc. of finished extract was equivalent to 1 gram of the original drug. These extracts were shaken out, as in Kauder's method, with water acidulated with sulphuric acid and again shaken out with ammoniacal chloroform and ether. Two alkaloidal residues were thus obtained--one, the ether extract, or "alkaloid A" of Kauder, representing the alkaloids anhalonine, pelletine, and lophophorine; the second, or chloroform extract, the

"alkaloid B" of Kauder, which represented the alkaloids mescaline, anhalonidine, and anhalamine.

The chloroform residue from 100 grams of mescal was taken up with 5 cubic centimeters of alcohol and reserved for later physiological tests. This extract (chloroform) should represent largely mescaline, to which the peculiar cerebral effects of the drug have been ascribed. The alcoholic fluid extract represents all the alkaloids found by Kauder and should, therefore, be identical with the crude in its physiological effects.

At this point it may be well to note that with every extraction there was a greenish-brown residue of a somewhat resinous nature which yielded no alkaloids on extraction with acidulated water. In the light of subsequent tests of the physiological action of the drug, it would seem that this resin may be concerned in the peculiar effects which this drug produces.

Physiological Tests.

The following were used:

(1) An alcoholic extract representing the above chloroform residue "B" of such strength that 1 cubic centimeter represented 20 grams of drug. One drop thus represented approximately 1 gram of mescal.

(2) A fluid extract of mescal, 1 cc. representing 1 gram of drug.

(3) The mescal buttons entire. The buttons used averaged somewhat more than 3.5 grams each in weight.

On November 24, 1911, I went to my room, taking the above supplies of chloroform extract, fluid extract, and mescal buttons. The following data I recorded on a sheet of paper lying on a table:

At 4.30 p.m. November 24, 1911, took 3 drops of chloroform extract diluted with water.

At 5 p.m. took 4 drops of chloroform extract diluted with water.

At 5.30 p.m. took 8 drops of chloroform extract diluted with water.

At 6 p.m. took 15 drops of chloroform extract diluted with water.

Up to 6 p.m. no abnormalities of vision or other function observed. No effect from above at 7 p.m.

At 7 p.m. took 20 drops of fluid extract (1 cc. equals 1 gram).

At 7.40 p.m. no effect from above other than dilation of pupils and slight stimulation. Ate 1 mescal button. (Vision first distorted at 8 p.m.)

At 8.20 p.m. ate 1 mescal button.

At 8.40 p.m. ate 1 mescal button.

At 9 p.m. ate 1 mescal button. (Nausea.)

Senses normal at 1 a.m.

Such investigators as Havelock Ellis, Drs. Weir Mitchell, Prentiss, and Morgan have also experimented upon themselves by eating mescal, and my own experiences were in the main quite similar to those recorded by the above observers.

The above data for the chloroform extract seem to indicate either that not all the mescal is removed by Kauder's method or that the pronounced effect of the drug is not due entirely to that alkaloid. It is well to note that the amount of this extract taken during $2\frac{1}{2}$ hours was equivalent to 30 grams of drug, or about 8 buttons.

The alcoholic extract was much more active, as evidenced by the fact that the pupils began to dilate. The effect of this dose was simply a slight stimulation. The experiment with the fluid extract was not continued further on account of the lateness of the hour.

After taking the first mescal button I experienced after about the 5 minutes a feeling of well being and a gradually increasing acuteness of visual perception. This was so pronounced as to attract my attention at the end of about 15 minutes. I was sitting in a rocker turning the pages of a book, when I happened to glance up at the wall. I was startled at first to see for the first time a vivid crack in the wall beside the door. The surprise was so great that I rose and walked toward the door to ascertain the reality of the phenomenon. The crack was really there; but as I ascertained next day was so inconspicuous that it would not ordinarily attract the attention of any but the closest observer. I quickly realized, having had a similar experience with strychnine, that the phenomenon was due to increased acuteness of vision and was not an hallucination. I quickly proved this point to my own satisfaction by sitting quietly and staring at the wall opposite. The effect was equally startling; for I could perceive inequalities in the shading in the oil coloring of the wall, which had always previously appeared to me to be a uniform tan brown color. At this stage those phenomena were clearly not of the hallucination type; but were due solely to increased acuteness of vision and perception of color. This would explain the shadow or "picturelike" effect which other observers have noted while viewing familiar objects while under the influence of mescal. Just before taking the second button I noticed by looking into the mirror that the pupils of my eyes were strongly dilated. The third button produced the first alarming symptoms. I ate half of that button and attempted to walk across the room. Though I accomplished this successfully there was a truly remarkable muscular weakness in my legs so that at times I had to assist myself with a chair.

A most peculiar and interesting thing in this connection was the fact that the tendency of the body was to fall backward; never to the side or forward. In fact I have a distinct recollection of walking down the hall with my body bent forward, almost double, in the effort to keep from falling backward. I resumed my chair as soon as possible and was extremely exhausted. It then required the greatest effort of the will on my part to force myself to eat the other half of the third button. My nervous agitation became extreme, and

I solved the problem by lighting a cigar. After smoking but a few moments I became composed and finished the third button. The tremulous movement of my hands ceased, and I felt at peace with the world. Feeling a great desire to lie down, I managed in spite of extreme weakness to undress myself and go to bed (9 p.m.). Just before I retired, however, I ate the fourth and last button, notwithstanding a protest of nausea during the process. Though the electric light in my room did not distress me earlier in the evening, it began to cause me great discomfort before I took the last button, and I therefore switched off the light when I retired to bed. After I had assumed the recumbent posture I recall turning over on my side but once, and I recovered complete consciousness in that position. Within a few minutes muscular weakness had so increased that I was able only to move my fingers and toes. Though I exerted all my will power, I could not force my right hand to grasp my left upper arm, which it was touching. The fingers would move separately but not together as a whole hand. My eyes were wide open, and I was perfectly conscious of my condition. I could hear the clock ticking and also the noise of the trains in the yards downtown. I experienced no fear or other discomfort, for I had no desire to sleep, as is the case in an opium intoxication, and felt that so long as I kept awake I was in no danger. With my eyes open, staring into the darkness, I witnessed a kaleidoscope of colors somewhat similar to those described by other observers. It would be folly however, to attempt a detailed description of them by reason of their almost infinite number; but I shall mention a few examples. One curious fact was noted that the duration of each burst of color was coincident with the noise of the ticking of my clock standing on a dresser in my room. This has since led me to believe that the very ticking itself was responsible for the regularity of the visions; since other observers have noted that any sound called forth a burst of color. In this connection it may be noted when the Kiowa Indians are celebrating the mescal rite the intoxicated persons are said to be seated before a flickering fire, while attendants beat upon drums throughout the entire night. Here, again, sound would seem to be a factor in producing impressions on the auditory centers which result in the production of visual hallucinations. At first I saw only a succession of luminous, billowing balls not unlike tiny electric-light bulbs and all of a green color of every conceivable shade. After a time these became interspersed with red ones, and the fountain-like shower of color continued. Later, these colors came in pairs, usually of red and green, orange and yellow, and, most curious of all, purple and gold. The latter were always in bands which burst forth in ribbonlike streamers and suddenly disappeared to give way to other colors.

Presently the colors began to appear in a long broad band similar to the visible spectrum. In fact, it had the appearance of that band of color except that the violet end was absent. I recall that even in my condition of semi-stupor I noticed this difference from the experience of other observers. Others had quite unanimously reported violet as a predominant color, and up to that time I had seen neither blue nor violet, though I had witnessed a few purple flashes. I amused myself for a time by mentally calling for the appearance of several colors of the spectrum. Indeed, I found that when I wanted green the whole band of color was green of innumerable shades. The same was true of red, orange, yellow, and purple. When I began systematically calling the spectrum colors--violet, indigo, blue, green, yellow, orange, and red--I found that it was only by repeated and insistent calling that I obtained a vision of the violet end, and then it was unsatisfactory and transitory. One of the last visions that I recall was one of a vast field of tall golden lilies each pouring forth a stream of purple flame. This was an exceptional case, for most of the visions were not associated with familiar objects but were simply a mass of

twisting, undulating, luminous objects of a more or less regular or coil-like shape.

At one time I seemed to see a writhing coil of twisted golden rope whirling its way from the pit of my stomach up to the mouth and then completing a circle back into the stomach again. Every movement was executed with incredible celerity and the scenes changed as regularly as the clock ticked. Having once seen any given vision, it disappeared, to be seen no more.

These visions continued for what seemed many hours, and suddenly I felt that my senses were normal again. I rose from my bed, feeling perfectly natural, and turned on the electric light. Instantly I was blinded by a flash of purple light which enveloped everything in the room. I closed my eyes and then opened them cautiously. This time I noticed no effect other than a sensitiveness to light. I thought that it must surely be about 6 o'clock a.m. and carelessly glanced at the clock. I was momentarily astounded to see that it was but 1 a.m. I had been in a state of trance for just four hours and it seemed like a whole night. I returned to bed, where I lay quietly till about 2.30 a.m., when I fell asleep.

At 8 a.m. I awoke, feeling no ill effects from my night's experience. But throughout the day I felt sluggish, both physically and mentally. My eyes were somewhat sensitive to light, though the other perceptive senses seemed somewhat blunted. There was a pronounced tendency to shallow breathing and deep inspirations with always made with more or less effort as if the respiratory muscles were fatigued. By 6 p.m. of the day following the intoxication I felt perfectly normal and slept soundly the following night.

The following observations were made while sitting in a chair after the second button was taken:

Pulse, 84 per minute; soft and small.
Respiration, shallow; not markedly affected.
Skin, hot and flushed.
Eyes, dilated.
Cardiac region, no discomfort experienced.
Muscles, relaxed; slight tremors in hands and legs.
Ears, faint, persistent roaring.

The statement that the drug produces no after effect surely needs some qualification. The general rule that the "the result of continued stimulation of a given function ends in depression" seems to have no exception in the case of this drug. Certainly there is no after sensation of pain or other physical discomfort, but the decided languor and lack of energy resulting from the use of the drug must surely be considered as due to overstimulation, as is the case with many other intoxicants.

The intoxication is by no means comparable with that produced by alcohol. The intellect remains clear; speech, though difficult, is not impeded or abnormal, though the voice sounds strange and far away to the speaker. The instability, when standing, appears long before there is distortion of vision and the tendency to fall is always backward. The nausea which often follows opium or alcoholic intoxication is entirely absent, and in addition there is no excessive thirst.

In conclusion, I may state that I should not care to repeat the experiment with a dose exceeding four mescal buttons. The muscular paralysis is so complete that one might cease breathing, thus ending the experiment.

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EXHIBIT B.

The University of Kansas,
Lawrence, May 8, 1915.

A. R. Snyder,
Superintendent and Special Disturbing Agent,
Potawatomi Agency, Mayetta, Kans.

Dear Sir:

Your letter of the 6th and the mescal buttons at hand.

Permit me to state that we have examined these buttons and tested them physiologically in our pharmacological laboratory.

We have found them to contain about 1 per cent of poisonous alkaloids, and these alkaloids, when experimented with upon animals, give the following physiological actions: They first increase reflex excitability, and later the animal passes into quiet sleep. The respiration is depressed and becomes full and deep. The circulation is weakened and the heart beat is diminished in rapidity. Poisonous doses produce intense muscular spasms, especially of the stomach and diaphragm, followed by tetanus convulsions resembling those caused by overdoses of strychnine.

I would say that, although in the Harrison Act the mescal button is not mentioned especially, it should be regarded as a habit-producing drug and should be restricted or prohibited by the provisions of that act.

Please understand that I am no authority on the question of the buttons being a habit-producing drug, but from all I have learned from various communications I am inclined to think that it is decidedly one of this class. It is said to have a remarkable effect upon the imagination, and it is also said to be regarded by the Indians as the vegetable incarnation of a diety.

I do not consider the drug to be one that can be classified with the opium group, but it is, nevertheless, a harmful drug, and should be controlled in its use among those who have no conception of the harm which may come through its employment.

If there is any further assistance I can render you, I should be very glad to do so.

Very truly yours,

L. E. SAYRE.

EXHIBIT C.

Salt Lake City, Utah, March 10, 1916.

John K. Hardy, Esq.,
Secretary of Gov. William Spry, Salt Lake City, Utah.

Dear Sir:

Complying with your request of recent date, I take pleasure in submitting herewith the results of my investigation in regard to the plant known as "peyote."

PEYOTE.

Description.-- The commercial article known as "peyote" constitutes the dried root and dried blossoms of a small cactus plant which grows abundantly in the valley of the Rio Grande, in the southwest portion of the United States and also in the adjacent parts of Mexico. The dried blossoms may be briefly described as occurring in irregular, flattened, more or less round, dull-brownish pieces, about an inch and a half in diameter and a quarter of an inch in thickness, heavily wrinkled, the bottom of the blossom showing the circular place where it had been detached from the cactus. The other side presents a circular tuft of silkylike mass of fibers, soft and closely matted together. The dried blossoms possess a characteristic, somewhat narcotic, odor and a peculiar bitter taste, which becomes more prominent upon chewing the blossom.

Uses.---Very little is known regarding the medicinal properties as well as the characteristic chemical constituents of the peyote plant. As stated above, both the roots and the blossoms are used, the latter, however, being preferred. According to statements of reliable parties, actually acquainted with the conditions, in recent years a dangerous practice has come into use among the Indians, notably the Ouray Utes, in acquiring a habit of for this drug. Its effect upon these people appears to be similar to that of opium. The blossoms, including the tuft of silky fibers, are chewed and eaten similar to the way the Peruvians derive the effects of cocaine from chewing the coca leaves. At first the peyote blossom causes a great state of excitement and mental exhilaration. Then it deadens the senses, produces abnormal dreams, is demoralizing, and, finally, this peyote causes the Indians to remain drunk or in a stupor for two or three days. Peyote was first introduced under the form of a religious ceremony and during the reading from the Bible, prayer, singing of songs, and dances the peyote would be passed around until the Indians were drunk with it. At the present time the Ute Indians hold their "peyote services" every Saturday night until Sunday morning at Raddlette, Utah, and from all accounts this habit of evil is growing at a very rapid pace, with decidedly demoralizing effects upon these people.

Investigation.---Besides the usual plant constituents, such as starch, resin, wax, gum, mucilage, tannin, etc., I have found that the dried blossoms of this plant contain an "alkaloid," an active principle similar to that which is contained in opium, coco, and other powerful narcotic drugs.

Prollius modified fluid appears to extract the active virtues of the plant, and, furthermore, from the alkaline-ether residue there is obtained an alkaloidal principle which possesses the following properties and reactions:

Grayish white, distinctly crystalline, of a bitter taste, and practically inodorous; combines with acids to form salts. This principle, furthermore, responds to all of the common alkaloidal reactions and, with the special alkaloidal reagents, it gives characteristic color displays. The salt of this alkaloid yielded identical reactions.

The following are recorded herewith:

- A. Sulphuric acid: Bright canary yellow.
- B. Sulphuric acid plus nitric acid: Deep brownish red, changing to orange red and finally dull brownish.
- C. Sulphuric acid plus bichromate: No change.
- D. Nitric acid: Colorless at first, soon changing to bright reddish brown.
- E. Froehde's reagent: Deep Nile green.
- F. Vanadine sulphuric acid: Greenish bluish, becoming darker upon standing.
- G. Erdman's reagent: Light orange.
- H. Iron chloride: No change.
- I. Iodic acid: Slight reduction.
- J. Ferricyanide potash plus iron: Bluish-greenish color.
- K. Mayer's reagent: Heavy precipitation.
- L. Picric acid: Heavy precipitation.
- M. Gold chloride: Heavy precipitation.

Further investigation is being made to obtain a quantity of this alkaloidal principle.

More than a month ago a request was made by the undersigned of the Thomas Nelson Research and Information Bureau of New York in regard to peyote, its medical properties as well as the characteristics of this plant. Up to the present no reply has been received.

Summary and conclusions.-- The plant or drug known as "peyote" contains, among other constituents, an alkaloidal principle to which, no doubt, are due the powerful narcotic actions upon the human system. It is earnestly recommended that the next legislature take the proper steps to include this plant or drug among the list of prohibited narcotics, as, no doubt, its indiscriminate use by the Indians and the laity produces a demoralizing, harmful, and depraved condition.

Respectfully,

HARMAN HARMS,

State Chemist.

EXHIBIT D.

STATEMENT OF DR. HARVEY W. WILEY.

February 21, 1918.

Mr. Tillman. State for the record your name, occupation, and experience as a physician,

Dr. Wiley. Harvey W. Wiley. For 29 years I was Chief of the Bureau of Chemistry of the Department of Agriculture. I can hardly describe my occupation now. I am an editor, lecturer, and farmer, mostly a farmer.

Mr. Tillman. Are you a practicing physician; or have you been?

Dr. Wiley. I am a graduate in medicine, but I was never a practicing physician.

Mr. Tillman. You may begin and in your own way tell what you know about this drug peyote-- what it is, what use is made of it, and whether you have investigated to find out its constituents; and, if so, tell what they are?

Dr. Wiley. I will detail to the committee my own personal experience and relationship to this drug. It was brought to my attention along about 1893, or near that time, by Mr. James Mooney, of the Bureau of Ethnology, who had spent many years among the Indians of the Southwest, and who was familiar with the use of peyote cactus by the Indians with whom he lived. He brought with him on his return to Washington quite a large number of these ripe and dry buttons of the cactus. He came to see me and asked whether I would undertake a chemical examination to determine, as far as possible, the physiological properties of this product. I undertook the task of determining both of these qualities, the chemical composition and the physiological properties. Having no pharmacological laboratory of my own I asked Dr. D.W. Prentiss, professor of materia medica at the George Washington Medical School, and his assistant, Dr. Francis P. Morgan, who was professor of pharmacology in the same institution, to undertake the experimental work. Dr. Morgan since then has been employed--at least for 10 or 15 years--as a pharmacologist in the Bureau of Chemistry. I went over to the bureau to see if I could get him to come and give personally the results of that work, but he has gone into the Army and is not available. I have an account, however, of his work. I consulted with him frequently during the progress of it, so that I can give very well that part of the work which I asked these gentlemen to do.

I asked Mr. Ewell--dead now--who had been for many years one of my very competent assistants, to undertake the chemical work, which he did, with my collaboration and constant supervision and suggestion.

The chemical work is easily described. He found that this bean contained three alkaloid bodies and also a resin. He separated these bodies from combination and determined the chemical character of each. Two of the alkaloids are crystalline and one partially so, but not entirely so. He

delivered these alkaloids to Drs. Prentiss and Morgan for their physiological tests, and also samples of the whole button. These alkaloids themselves do not produce the intoxication which is produced by the button. They are, however, very toxic. Administered to guinea pigs and mice all of these alkaloids produce the same effects, practically, as are produced by strychnine--convulsions, opisthotonos; that is, the bending of their heads backward, and the general condition and appearance that result from a similar use of strychnine. The lethal dose was also very small. It required only a very small quantity of these alkaloids to produce death in guinea pigs and in frogs. Death seemed to be produced by the paralysis of the respiratory organs and not of the heart, because the heart would beat sometimes 15 or 20 minutes after the animal was dead. So it did not get to the heart to produce death, but produced paralysis of the nerves and muscles of respiration. In other words, death was produced by asphyxiation, and not by any specific action on the heart.

When these alkaloids were administered to young men by Drs. Prentiss and Morgan they did not produce any of the symptoms of intoxication and visions of a delightful character and the lack of coordination of the mental faculties which are produced by the button alone. Therefore we infer that the toxic principle--that is, in producing intoxication, which supervenes upon the use of these buttons--is due to the resin. In this instance it is like cannabis, which produces a similar kind of intoxication when given to human beings, the only difference being that it is perhaps more active even than the toxic principle of the cannabis.

Now, my own connection with this was in the organization of the investigation and in following it up throughout personally by frequent consultations. After the work was done Mr. Ewell decided that he would like himself to become a subject of experimentation. I rather discouraged him, saying that Drs. Prentiss and Morgan were turning to that part of it. But as he was a man very anxious for complete investigation he wished to try it on himself, and finally I consented. I assigned one of his laboratory mates to be with him in this work. He was to take the beans on Saturday evening, so that the intoxication might come on a day of rest and thus not interfere with his work. So he took the buttons home with him and he chewed them in the manner described by Mr. Mooney as being practiced by the Indians; he chewed them until they would form a bolus, and then swallowing the bolus. Meanwhile, he himself, with paper and notebook, took down all the symptoms which he was able to observe; his laboratory mate was with him all the time and also took notes of his condition. The first symptoms are those which are usually observed in all these cases; that is, a feeling of contentment, of relaxation, and of indisposition to physical exertion, accompanied by the most beautiful visions, beautiful colors, and myriads of colors of very agreeable character.

It was only a short time after Mr. Ewell began to take notes until they became entirely incoherent, meaning nothing at all; and after his recovery he took his own notes and could make nothing of them after the first few entries. The notes made, however, by the observer were coherent and were easily translatable into results. About 2 o'clock on Sunday morning the condition of Mr. Ewell became so alarming to his roommate that he came with Mr. Ewell to my residence and awakened me, the laboratory mate feeling he could not take the responsibility any longer. From that time on I was

personally present with Mr. Ewell until his recovery, so that I had personal observation of his deportment. One of the strong results of the use of this bean is inability to sleep, which is entirely unlike morphine and somewhat resembles cocaine. He had no disposition to sleep at any time. It was 48 hours before he could sleep after he had taken these beans and after the excitement had gradually passed away. He was constantly talking and saying, "Oh, how beautiful; oh, how splendid; how magnificent." I was particularly struck with this expression. I knew something of his views and he was a great admirer of Robert G. Ingersoll. One of the things he said was, "Oh, I wish I could talk with Ingersoll just for a minute; I could convince him that there is a heaven. I see it. I see the angels in the streets of gold." Of course, the heaven which he saw was the heaven that had been described to him. The Indian probably sees a heaven of a different kind, the chase, or something of the kind. He saw visions that were perfectly entrancing, as translated from his remarks and descriptions of them.

I soon became convinced that there was no danger to his life, as he had not taken any more of these buttons; but I remained with him all the next day and until quite late on Sunday night, when he was beginning to come out of this intoxication. One of the curious things was that after his recovery he could not recall from memory these visions; they seemed to have escaped entirely from his memory and his mental vision. While there was nothing violent or dangerous about him, these wholly incoherent remarks showed an absence of events of a logical character. The centers of the nervous system, which respond to external sensations of pleasure, seemed to have been particularly excited by this drug, in that respect very much like alcohol in its first stages, although not producing, as alcohol does, a state of complete stupor. There is another difference between the action of this drug and the intoxication produced by it from that produced by alcohol, though at first the sensations are somewhat similar. For instance, persons under the influence of alcohol think their minds are stimulated. They think so; but accurate investigation and experiments show that alcohol always diminishes the power of the intellect and the power of the body to do its work. So that the man who thinks he makes a good speech under the influence of alcohol has lost his sense of coordination in what he sees, and when a man speaks without fear he always speaks more fluently and more eloquently than when under the restraint of reason and surroundings. So that this increase of mental activity is only apparent and is not real, as is easily determined by any investigation.

I would like to say a word about the therapeutic properties of this drug. I will not deny that, like other powerful drugs, such as opium, cocaine, and strychnine, it has some therapeutic value. That is shown by the investigations conducted by Drs. Prentiss and Morgan, but after summing up their experiences in the relief, for instance, of asthma or the pains of rheumatism by this drug, they say it is evident there is no cure in any of these cases, but only a relief from the sense of oppression and of pain. So that while this drug will undoubtedly secure a relief from pain or from the spasm of pain, as in the case of asthma, it has no real therapeutic effect, nothing that would tend to remedy the cause of the disease, and hence its therapeutic effect is purely one of solace and forgetfulness. In the same way they showed that physical power was impaired; that there was a distinct indisposition to move, as was shown when Mr. Ewell made his experiment. The patient under the influence of this drug likes to remain quiet, and often with closed eyes, seeing these beautiful visions, which come to him even more vividly when his eyes are

closed than when they are open. But there is a distinct lowering of physical vitality during the period of the intoxication.

Of course, the experiments which were made under my initiation were only of a temporary character. They were not repeated, so that we had no opportunity to determine what the final effect would be by a repetition of this experiment upon the mental and physical qualities of the individual. But one who is acquainted with the facts of pharmacology and the effects of drugs can draw this conclusion, as we can from all similar effects: That any undue excitation of the nerves or the muscles must, of logical necessity, be compensated for in some way. We can not excite our minds or our bodies to undue exertion without using up power, energy, and tissue, and that must be compensated for by its restoration. So that the effect of this sleeplessness, for instance, if only for a day or two days, may entail no subsequent injury, yet if it is continued--sleep being a physiological necessity--it will have a very harmful effect, because any drug which interferes with that necessity must produce a harmful effect. You can be under the influence of alcohol for once and never be able to distinguish any subsequent injury, but it does not follow that you can repeat that day after day, and as a result of this unnatural excitation in the end escape injury. That is contrary to all rules of logic and of sequence. Therefore, I would infer that a drug which had such a powerful exciting effect upon the nerve centers, and especially those of vision and imagination, if continued day after day, must, of necessity, injure the nerve centers which are excited. I think that is a conclusion which no logical man, familiar with the effects of drugs, can escape. That is shown vividly in the use of all of these so-called narcotic drugs; that is, the increasing quantity of them necessary to produce the excitation.

If you have never used alcohol a spoonful of it may give a decided sensation, but the man who constantly uses it requires more and more of it to produce the exciting effect. The alcohol has not changed its qualities at all, but his sense of perception has diminished and his degree of tolerance, as we call it, has increased. That is particularly true of opium and its alkaloids. Persons who are addicted to the use of opium may take doses of morphia apparently with impunity which would kill a person not used to it at once. Therefore, I should say this drug is no exception to this rule. I do not know of any exception, and while I can not testify to its effects when used continuously, as a result of my own observations I think I can draw the logical conclusion which is of some value in connection with the statement I have made as to other drugs of similar character.

Mr. Ewell made a very extensive chemical examination of this drug, which is contained in the 18th volume of the Journal of the American Chemical Society, giving photographs of the several alkaloids, and a full description of their effect is given. Then I have here the report of Drs. Prentiss and Morgan, which has been reprinted from the Medical Record of August 22, 1896. It also contains a reference to the chemical work performed, gives the same pictures and gives in detail all these experiments on animals and also experiments on young men.

Mr. Tillman. I believe you stated that this drug has some therapeutic properties of value?

Dr. Wiley. Yes, sir.

Mr. Tillman. Ought they not to be administered under the advice and on the prescription of a physician?

Dr. Wiley. Most decidedly. The more powerful the drug the more important it is that there should be no lay administration of it. This is a drug which should be classed with strychnine, opium, and cocaine.

Mr. Tillman. You have qualified as an expert and are an expert in the judgment of the committee. Would you advise the absolute prohibition of this drug, as is provided in this bill?

Dr. Wiley. I surely would.

Mr. Tillman. The statement has been made that it has an exciting effect upon the sexual organs?

Dr. Wiley. I do not know anything about that; I have never made any investigation along that line at all.

Mr. Snyder. You state that while this peyote might allay pain in certain diseases, it would not effect a cure?

Dr. Wiley. Yes, sir.

Mr. Snyder. Do you know Lone Wolf's wife?

Dr. Wiley. No.

Mr. Snyder. She appeared before me the other day as a living example of one who had been cured of chronic rheumatism, and she looked as though she was cured.

Dr. Wiley. Well, that is no evidence.

Mr. Snyder. I do not think it is, but I am simply raising the point; that is all. They claimed she was cured by this drug, and that many other cures had been effected in the same way.

Dr. Wiley. I have noticed a Member of the United States Congress certifying that nuxated iron is the most wonderful healer in the world, but that does not convince me about nuxated iron.

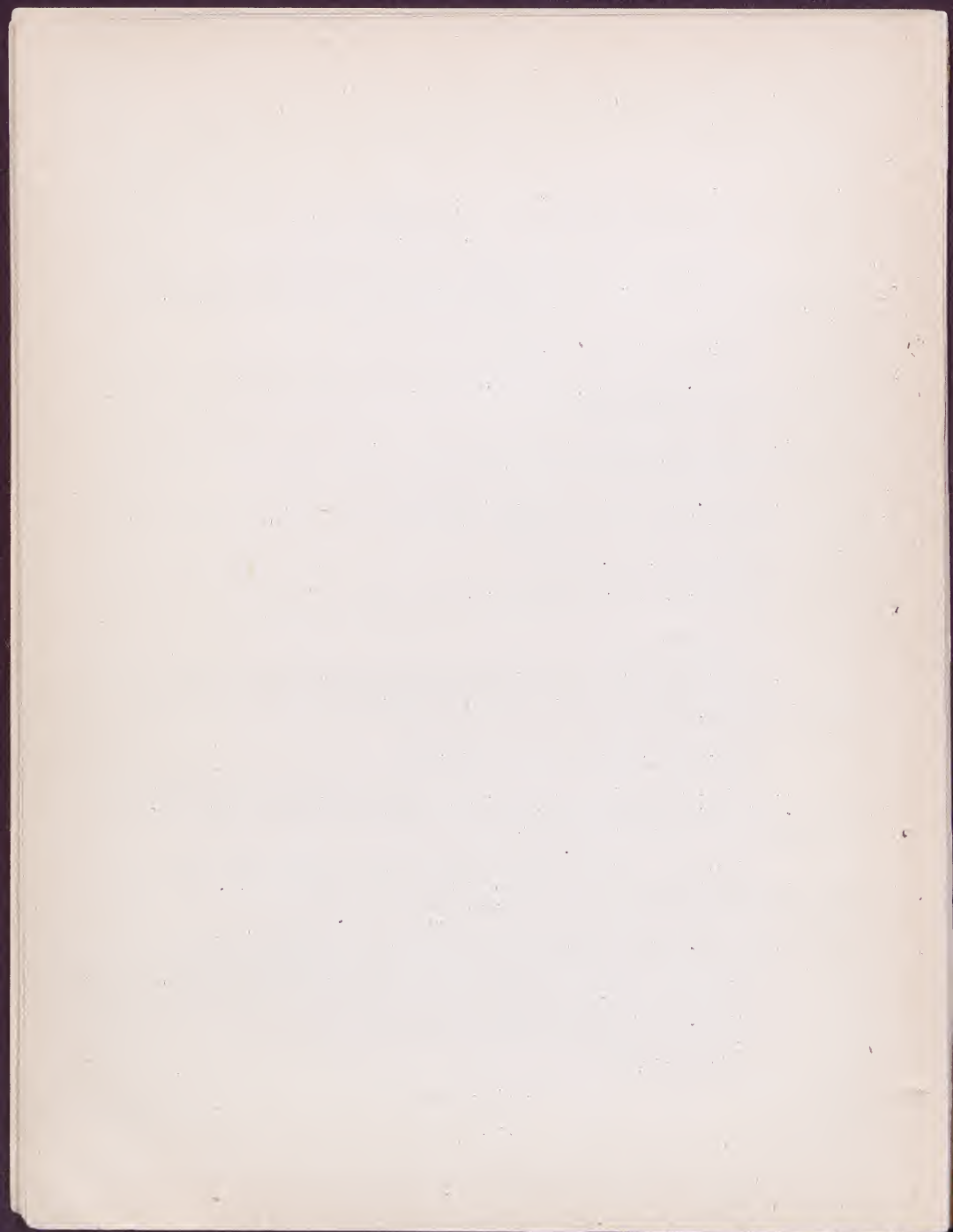
Mr. Tillman. You think this is not a cure at all for rheumatism?

Dr. Wiley. Absolutely not; I wish I knew some cure for rheumatism.

Mr. Tillman. Is there any?

Dr. Wiley. None.

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"On two occasions when deeply under the influence of the drug, there was an indescribable feeling of dual existence; thus, after sitting with closed eyes subjectively examining the color visions, on suddenly opening them for a brief space one seems to be a different self, as on waking from a dream we pass into a different world from that in which we have been. This may be to some extent comparable to the rhythmical rise and fall of the 'physical waves' in Indian hemp intoxication.

"But by far the most remarkable of these subjective phenomena are the sensory hallucinations, especially visual. These arise gradually, and are at first only seen with closed eyes; in the early stage (in my case) they closely resemble an attack of megrim, in that they show the same undulatory motion of zigzagged lines. The visions rapidly become more marked, until on closing the eyes a regular kaleidoscopic play of colors can be seen with either eye; precisely the same; hence the condition must be central.

"These colors may assume all kinds of fantastic shapes; they are never still, but constantly in motion, sometimes in a circular or to-and-fro manner, but more generally there is a kind of pulsation somewhat similar to that in the cinematograph. It is interesting to note that pressure to the eyeball was sufficient to alter the colors and change the type of vision. In no case were visions of external objects seen, but always the same dashes of color, of a brilliancy and blending which in the intoxicated condition one considered of indescribable beauty, and even as a memory still seems to possess a charm. The coloring of all external objects is intensified. The light blue shadows seen with the eyes open in this stage are, as suggested by Ellis, probably due to dilation of the pupils. Dobrowsky has shown that the dilation of the pupils is necessary to such vision.

"The effect of the sound of the piano was most curious and delightful, the whole air being filled with music, each note of which seemed to arrange around itself a medley of other notes which appeared to me to be surrounded by a halo of color pulsating to the music."

"Anhalonium Lewinii (Mescal Buttons)."-- A study of the drug with special reference to its physiological action upon man, with report of experiments. By D. W. Prentiss, M. D., and Francis P. Morgan, reported in the Therapeutic Gazette, 1895, volume 11, from page 577 to page 585. Drs. Prentiss and Morgan, after an extensive study of the characteristics of the mescal button giving its uses by the various Indian tribes of the United States with reference to their religious ceremonies, made a number of experiments upon the human subject, and recorded in detail the physiological action of the drug. A record of the action in each case was kept, and the entire number compared, and the following results reported:

"The production of visions is the most interesting of the physiological effects of the Anhalonium Lewinii, as shown by these experiments. The visions ranged from ill-defined flashes of color to most beautiful figures, forms, landscapes, dances--in fact, there seemed to be absolutely no limit to the variety of visions which the drug could produce. They could in but few cases be seen with the eyes open, but upon closing them an ever-changing panorama appeared. The predominating feature of the vision was the color effects, although the figures, forms, etc., were in themselves sources of pleasure and admiration. Drumming, or otherwise marking regular time, enhanced the beauty and variety of the objects seen. In two cases the visions

were under the control of the will, and in one case they were subject to the suggestion of others. The amount of pleasure derived from the drug seemed to vary inversely with the amount of muscular depression present. The effect of the drug in the production of visions is in all probability due to the stimulation of the centers of vision in the brain. The persistent ache and feeling of exhaustion in the occipital region, which was present for several days after Experiment 4, is of interest in this connection.

"In some cases no effect whatever was produced upon the reason or will of the individual; In others there was some slowness of thought and loss of power of expression, and in Experiment 2 a marked delusion. Compared with other intoxicants, however, the effect upon the mind is extremely slight.

"Dilatation of the pupil was well marked in every case, and persisted for from 12 to 24 hours after the drug was taken. The dilatation was accompanied by a slight loss of the power of accommodation and consequent disturbance of vision.

"More or less depression of the muscular system existed in every case, and this was the first effect noticed after the drug was taken. It ranged from a feeling of lazy contentment to marked muscular depression. Susceptibility to this effect varied widely. Whether the sedative action is caused by depression of the nerve centers, peripheral nerves, or their nerve endings, or of the muscular fibers themselves, we are unable at present to state; but from concomitant nervous effects we are inclined to the belief that it is due to depression of the nervous system and not of the muscular fibers themselves.

"Partial anaesthesia of the skin was present in three of the cases, appearing when the effects of the drug began to wear off.

"The heart action is at first rendered more slow and somewhat weaker in quality. This is followed by a rise to the normal in quality and rapidity, which continues during the period of greatest activity of the drug. In the cases in which the muscular depression was greatest, slight, if any, depression of the heart was present.

"The respiration was unaffected in all cases except one. In this it seemed to partake slightly of the general muscular depression.

"Upon the stomach the drug produced an effect which varied from a feeling of uneasiness and fullness at intervals to nausea and vomiting.

"Inability to sleep for at least 12 hours after the effects of the drug commenced to pass off was a marked effect.

"Loss of the sense of time existed in all cases.

"No constant effect upon the bowels, skin, temperature, and the amount of secretion of the various glands of the body was found.

"The only record of the taking of Anhalonium Lewinii for experimental purposes which we have been able to find is that of Briggs. He took a "third of a specimen," and the symptoms produced were the following: in 15

minutes the pulse rose from 60 to 70. In 30 minutes there was fullness of the head, pulse 90. respiration 26. The sense of fullness increased, and was followed by a headache and swimming in the head. Suddenly the pulse showed up to 160 and the respiration increased so that he could with difficulty get sufficient breath to keep himself alive. He thought he was about to die, and became unconscious. In 6 or 8 hours his pulse and respiration went down again to the normal. Great depression existed for 12 hours.

"The symptoms produced in this experiment are so widely different from those which we have obtained from administration of the drug that we can not believe that the drug taken by Briggs was the same one which we have now under consideration.

"Lewin, in experiments upon animals, found that in them the drug produced an acute muscular spasm of varying intensity, with increased reflexes, its action in this particular much resembling strychnine or brucine. No such effect was present, however, in our experiments upon man. Whether or not, it would be produced by much larger doses is, of course, a matter of conjecture. In some animals, also, a quickened respiration was noted, which effect was present in our experiments only in one case, and in the presence of great general muscular depression. In animals, also, the heart remained unaffected, whereas in man we found a primary slowing of the heart action. In both animals and man more or less tendency to nausea and vomiting existed in most cases.

"The physiological action of Anhalonium lewinii upon man can not be said to be identical with that of any other known drug. Its effects resemble those of certain drugs in some of the symptoms produced, but differ widely from them in others. Cannabis indica produces visions, with dilated pupils, and with slight effect upon the circulation. In these particulars its action is similar to Anhalonium lewinii. But cannabis indica is an hypnotic, and the delirium and hallucinations are in most cases followed by sleep. Anhalonium lewinii, on the other hand, tends to produce wakefulness in every case. The Indians do not sleep for 24 hours after the commencement of their ceremony, and in our experiments sleep was found to be impossible for about the same length of time.

"In this tendency to produce wakefulness it resembles cocaine. The visions produced by cannabis indica are generally of a gay character, producing much merriment, accompanied by a great inclination to muscular movement. The visions of Anhalonium lewinii provoked wonder and admiration but no merriment, and there was present disinclination to make any muscular effort. Other marked differences exist which will become evident to anyone comparing the action of the two drugs.

"Of the other drugs to whose action Anhalonium lewinii may seem to bear a faint resemblance--cocaine, belladonna, strychnine--the difference in action present is so great as to render it very improbable that any of them are active principles of the drug. Whether one or more of these substances or their alkaloids do not exist in the Anhalonium lewinii can not be stated until the chemical analysis is complete and experiments have been conducted to determine the identity of the principles isolated."

"The Phenomena of Mescal Intoxication (Mescal Buttons)," Dr. Havellock Ellis (London Lancet, 1897, vol. 1, pp. 1540-1542.)

Dr. Ellis's experiments were on the human subject. He used an infusion of three buttons given in three doses at intervals of one hour, and the following results are noted:

A dissipated, severe headache; produced a marked muscular irritability; the pulse continued to fall until the full effect of the drug was obtained, going as low as 48 per minute; produced shadows of various colors; there was nausea, with shallow respiration, dilated pupils, and motor incoordination.

Dr. Ellis states that motor incoordination and the thoracic symptoms of cardiac and respiratory depression were the only really unpleasant symptoms of the experiment. He thinks that the pleasure of mescal intoxication does not lie in any resultant passive emotional state, such as is produced by tea or alcohol, but strictly in the enjoyment of the color visions produced. Attention, he says, is impaired, but intellectual judgment remains unimpaired. The visions seemed to him as beautiful in memory as when he experienced them. The sensory phenomena seemed to be due to great and general disintegration and exhaustion of the sensory apparatus. Dr. Ellis is convinced that all the senses were more or less affected. There were vague dermal sensations, and the body felt unfamiliar to the touch, just as everything seemed delightfully unfamiliar to the sense of vision. He noticed also that any marked casual stimulation of the skin produced other sensory phenomena -- a heightening of the visions or an impression of sound. This is a phenomenon, he says, which may throw an interesting light on the synaesthesiae, or "secondary sensations."

"The Alkaloids of Anhalonium lewinii (mescal buttons), with notes upon Therapeutic Uses," by D. W. Prentiss and F. P. Morgan, reported in Transactions of the Medical Society of the District of Columbia, 1897 (vol. 1, pp. 123-127).

Drs. Prentiss and Morgan, after isolating from the mescal button a number of alkaloids, performed experiments upon the human subject to determine the action of these various preparations with a view to determining their therapeutic uses. After a careful consideration of the results of each experiment, they gave the following as possibly the therapeutic uses of the drug:

"The conditions in which it seems probable that the use of mescal buttons will produce beneficial effects are the following: In general nervousness, nervous headache, nervous irritable cough, abdominal pain due to colic or griping of the intestines, hysterical manifestations, and in other similar affections in which an antispasmodic is indicated; as a cerebral stimulant in neurasthenia and in depressed conditions of the mind -- hypochondriasis, melancholia, and allied conditions; as a substitute for opium and chloral in conditions of great nervous irritability or restlessness, in active delirium and mania, and in insomnia caused by pain. In the last condition it acts to produce sleep, not as a hypnotic, but by relieving the cause of the insomnia. In full physiological doses it produces insomnia, but in therapeutic doses it does not have this effect."

The following extract is taken from *Materia Medica and Therapeutics* of Dr. Cushman:

"It is similar to opium and cannabis indica, but more frequent color visions are produced. It does not produce the same amount of merriment that cannabis indica does, nor sleep as morphine. It produces imperfect coordination of movement, retards perception, and produces errors in estimation of time, due to its action on the cerebrum. Large doses cause depression of the respiratory and circulatory centers."

From Merck's Index for 1907, the following extract is taken:

"Mescal buttons cause an intoxication accompanied by most wonderful visions, beautiful and varied kaleidoscopic changes, sensations of increased physical ability, the physical and psychical functions remaining unimpaired."

"*Anhalonium lewinii* (mescal button)," Dr. D. A. Richards, reported in the *Denver Medical Times*, 1896-97 (vol. 16, pp. 213-217):

"First. Relieved a persistent case of trifacial neuralgia.

"Second. Relieved a case of inflammatory rheumatism, all excretions markedly increased.

"Third. Case of persistent trifacial neuralgia relieved and reported cured.

"Fourth. A case of gout with deposits around the joints relieved of suffering and the deposits absorbed.

"Fifth. Relief in all forms of gastro-intestinal colic. It lessens pain and causes diuresis. Increased elimination. It must be given with care, for an overdose is very dangerous.

The most vivid description of the action produced by this drug is given by Dr. S. Weir Mitchell, of Philadelphia, and reported in the *British Medical Journal*, 1896, volume 2, pages 1625-1629. He took in all about 6 fluid drachms of the extract at intervals from 12 night to 4.10 p.m., representing six mescal buttons. His condensed report is as follows:

"It will have been seen that mescal supplied me with one-sided (left) frontal headache, later with occipital pain on both sides, with colored zigzags or fortification lines, the rain of silver, and disorder of the stomach. I ask myself now if the migrains with visions are apt to be found in association with occipital pains in the regions of the convolutions, which we believe store up our ocularly acquired memories. It is worth an inquiry.

"The mode of action of mescal is somewhat curious and may vary with the dose and the man. At first, even at the height of drug action, the visions require one to wait with closed eyes for a minute or more. To open the eyes is to dismiss the vision, no matter how dark be the room. Suggestion availed me but little, and no act of will was competent to hold my dream unaltered.

"I found in these seeming laws some resemblance of those which -- in my case, at least -- appear to govern a quite ordinary and normal phenomenon. From childhood I, like some others, can at night, before sleep arrives, summon visions. These are not always just what I desire. Once present, I can not alter them; they shift, change, and disappear under influences not within my capacity to control or to analyze. To open my eyes, even in the most intense darkness, dismisses these visions. Is it true of opium visions? The same law certainly applies to some hysterical phantasms; but the explanation does not as yet seem attainable. My normal power to summon visions was entirely lost under mescal action. I tried to see faces, gardens, etc., but none came at command so long as I was under the influence of the drug.

"For the psychologist this agent should have value. To be able with a whole mind to experiment mentally upon such phenomena as I have described is an unusual privilege. Here is unlocked a storehouse of glorified memorial treasures of one kind. There may be a drug which shall so release a mob of verbal memories, or of music records, or, in fact, of tastes and odors. I naturally speak of things seen under mescal influence as glorified memories -- certainly nothing seen in these visions was altogether outside of my known experiences -- but everything was excessive -- forms were gigantic -- colors marvelously intermingled. In fact, nothing was simply the vision of a thing to be remembered and recognized except the familiar Newport Beach.

"I see no obvious therapeutic uses for mescal in massive doses. It is yet to be tested by continuous employment in moderate amounts, and may be of value.

"I sought so to limit the influence of mescal as to remain in full possession of all my faculties. The larger doses secure, as Dr. Prentiss has shown, more remarkable results, but may lessen the power to observe and to comment. I should dread a little lest excessive amounts might leave too permanent effects. In fact, I constantly carried for days a quite vivid image of one of these jewel clusters, seeing it mentally whenever my mind was turned upon the subject of my visions.

"I could match this also by a painful experience of some years ago, but I have said enough to show the great interest of this drug for physicians and psychologists. I predict a perilous reign of the mescal habit when this agent becomes attainable. The temptation to call again the enchanting magic of my experience will, I am sure, be too much for some men to resist after they have once set foot in this land of fairy colors, where there seems to be so much to charm and so little to excite horror or disgust.

"Were I to take mescal again I should dictate to a stenographer all that I saw and in due order. No one can hope to remember for later record so wild a sequence of color and of forms. But since talk does not disturb these visions, a perfect account might easily be given. No one has told us what visions come to the Red man. I should like to know if those of the navvy would be like those of the artist, and above all, what those born blind could relate; and, too, such as are born color blind. In fact, a valuable range of experiment is here to be laid open.

"I append to my own statement that of Dr. Eshner, one of the clinical staff of the Infirmary for Nervous Diseases. It will be seen that, although the symptoms were not unlike my own, there were some interesting differences. There was nausea, whereas I had none; there was no distinct headache, whilst mine was notable. In general, the experience was in Dr. Eshner's case more unpleasant than in mine or in those : Dr. Prentiss has reported, neither were the visions so remarkable nor the colors so vivid as were those I saw. It is as well to add, as concerns my own statement, that when twice in my life, I have had to take hypodermic injections of morphine for several successive nights, the drug ceased to cause sleep after the third night. Later it gave rise to visions of very remarkable character, which I have elsewhere described. These were seen whether or not the eyes were closed, if only the room in which I lay was entirely dark."

EXHIBIT F.

Experience of Charles E. Shell While Under the Influence of Pellote (Peyote)
on June 21, 1909.

The spread of the use of pellote (pronounced peyote) among the Indians of the United States is alarming. They claim that it is harmless and destroys the desire for the use of intoxicants. I had long desired to know for myself something of the effect of peyote upon an individual. I therefore made the following experiment upon myself. I took 10 large peyote units or buttons and steeped them in 1 pint of tepid water for 25 hours, at the end of which time I pressed the water which the buttons had absorbed into the remaining liquid, which was by this time about the color of sweet cider. After the units had the water pressed out of them the resulting liquid constituted about one and one-half ordinary drinking glasses full.

I began this experiment at 2 o'clock p.m., June 21, 1909, at which time I drank one-fourth of this liquid. It was quite bitter, and I found some difficulty in forcing myself to swallow it. At 15 minutes past 2 I drank another one-fourth. At half past 2 another, and a quarter of 3 the remainder. At 3 o'clock I could notice no unusual indications of having taken the drug, except a fullness in the head and a sort of tingling of the eardrums. An hour later I observed that the senses of sight and hearing were intensified. The ticking of my watch, which was carried in my shirt pocket, began to annoy me, although under normal conditions I do not notice it. At this time I was also languid and had a feeling of utter abandon. I laid down upon a comfort and yawned and stretched almost incessantly. While my reason was apparently unimpaired, I had no desire to talk, but only to be let alone. My thoughts now began to rise to a very high plane. I seemed incapable of having a base thought, but all were of a high order. I seemed to have forgotten that there was any evil in the world, all was good and pure.

I do not believe that any persons under the influence of this drug could possibly be induced to commit a crime, because crime is so foreign to the state of mind which exists.

There was no business thoughts and none of the everyday routine of life. They were along the line of honor, integrity, and brotherly love. Another peculiar characteristic of this condition is that one seems to be under

the influence of some hypnotist who directs ones thoughts and actions. I would become seized of a desire to walk, and, although I felt languid, I felt that I must walk. I arose and walked about a hundred yards westward to a fence; here I found myself impelled to return, but by another route. When I had nearly returned to the house I found myself stopped. I leaned up against the fence, placed my head on my arm, and remained for some minutes. Finally the physician who was watching the experiment called me to come to the house. I could not do so until several minutes afterwards, when the imaginary hypnotist allowed me to return. This inclination to walk and stop returned several times afterwards. On one of these tours the flowers along the way which are ordinarily purple were an intense and dazzling purple. A redbird sitting on the fence became an intense and dazzling splotch of red. The form of the bird being nearly lost. Every sound also was intensified. Modest colors, such as gray, ecru, and terra cotta, and the color of the road, remained the same. Only the more pronounced colors were intensified. While all objects remained the same form as usual, there was a peculiar appearance about everything. This may best be explained by saying that they appeared at times translucent, at others perfectly natural.

The clouds assumed rather fanciful shapes, such as I have, when a boy, imagined when lying upon my back looking at the fleecy clouds when they seemed to assume shapes of human faces, dragons, ships, etc. I was told by my attendant that he never saw the clouds look more unattractive. When I closed my eyes a procession of Chinese pagodas with beautiful colored trimmings, pleasing geometrical designs, and peacocks of brilliant plumage seemed to float in endless procession before me. A peculiar feature of this is that all of these scenes were statuesque; that is, there was no life. The peacocks seemed to be merely statues.

At no time did I experience any dizziness. While my head seemed full, almost ready to burst, there was no faintness. Locomotion was not interfered with, and the surrounding objects did not seem to float around me, as is the case with one who is under the influence of alcohol.

An incident occurred during the test which shows something of the state of mind I was in. The physician observed a young bird which had fallen from a nest in the tree. He secured a garden rake, placed the bird upon it, and lifted it up into the tree, hoping to return it to the parent bird. This is really what he meant to do, but it seemed to me that he was undertaking to bring about a universal brotherhood in the bird kingdom.

The experience is such that if one could always remain in that state of mind the millenium would be at hand. I had no inclination to do or say any absurd things that an intoxicated man does. I retained at all times my reason and occasionally talked with the doctor, but always with effort.

At 7 o'clock I was seized with a desire to sleep and went to my room and retired. As I was preparing to retire, there was a dry, rough sensation all over my skin, with a feeling of creepiness. This lasted for about one minute, and departed as suddenly as it came. I immediately fell asleep and slept just about an hour. During this time I had no dreams, but awoke with my mind as clear as a bell, although feeling the effects of the drug. At this time I secured paper and pencil and made the notes from which this article was written. The night which followed was sleepless and the following day the languor continued, although there was no feeling of depression.

During the four hours, from 3 to 7, I was slightly nauseous all the time. I do not know whether the drug produced this or not. I did not see any spirits or hold any conference with spirits -- celestial, terrestrial, or subterrestrial. This may have been because I did not erect any altar, beat a tom-tom, or shake a rattle (although I had a regularly dedicated rattle in the adjoining room), nor perform the ceremonies usually performed by the followers of the mescal lodge. I do not say this in mockery of the religion of these people, for religion is too sacred a thing to be made a mockery of, no matter how absurd or heathenish. I have insisted, however, that, in my opinion, the religious ceremony is only a cloak with which to cover this species of intoxication, for it is intoxication.

Another peculiar feature of this matter is that, except the experience of drinking the liquid, there is nothing unpleasant about the whole thing. The experience while under its influence is a delight, and for the time being the millenium has come. The recovery does not leave one with a headache nor any unpleasant feeling, but if as though one had ascended above the earth and when he returns does not do so with a thud as of a dropping of a sandbag, but as the floating down in a parachute.

The continued use must necessarily, however, be injurious, as any drug which will produce the unusual conditions of the nerves which this produces must necessarily, by its continuous use, rob the nerves of their vitality.

If this experience could be made universal and continuous, there would be no need of armies, navies, nor courts.

The report of the physician, Dr. Lindley, who observed this experiment, is given below.

CHARLES E. SHELL,
Superintendent and Special Disbursing Agent,
Cheyenne and Arapahoe Agency.

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Darlington, Okla., July 3, 1909.

On the 21st of last month Mr. Charles E. Shell expressed to me a desire to investigate the physiological action of the "mescal button" by placing himself under its influence, and requested me to assist him by being present to take observations and to record such signs and symptoms as might develop. The afternoon of June 22 was selected for carrying out the experiment, and 10 mescal buttons, steeped in a pint of water for 25 hours, was the strength of the dose to be taken. This aqueous solution was divided into four portions and taken at intervals of 15 minutes.

When I arrived at the home of Mr. Shell he had already taken two doses, or one-half the pint. I immediately began my examination, but nothing of importance had developed except a slightly flushed face and increased action of the heart, due, no doubt, to the stimulating properties of the mescal. The beating of the pulse had increased about 10 times and was full and bounding. After the third dose had been taken symptoms of a more positive

nature began to develop. There was partial dilatation of the pupils of the eyes, accompanied with visual disturbance, the strong action of the heart had changed, and instead of its beats being full and bounding they were weak, rapid, and thready, so rapid that it was with difficulty that they could be counted. Patient spoke of some nausea, but not enough to be annoying. The slightly flushed face had given way to one of pallor.

The taking of the fourth and last portion of the solution soon developed what I considered to be the full effects of the drug. The action of the heart, so far as I was able to judge, remained about the same as it was after taking the third portion of the solution. The pupils were dilated to their utmost extent, and remained so up to the time of my departure, about two hours after the last portion of the solution was taken. The writer has had two analyses of the mescal button made by expert chemists, and with the results of these analyses in mind was expecting symptoms to appear that did not develop; and, upon the other hand, symptoms were observed that no medical man would have looked for with either of the analyses before him. For instance, both analyses revealed enough opium to have fully counteracted the influence of the atropia that was present only in a very small quantity, but the action appeared to be reverse of this. There seemed to be an entire absence of dryness of the throat; in fact, the secretions were not interfered with in the least.

This briefly describes the objective symptoms as they were observed during the progress of the experiment. The subjective ones are graphically described by Mr. Shell himself, giving his experience with the drug during the entire period he was under its influence, which, in substance, differs very little from the crude descriptions given by the Indians of their experience with mescal while under its influence.

J. S. LINDLEY, M.D.

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EXHIBIT G.

State of New York,
County of New York, ss:

I, Robert D. Hall, of the State of New York, county of New York and city of New York, do hereby depose and say that on the 6th day of November, in the laboratories of the psychological department of Yale University, for the purposes of experimentation, took some peyote and during the day passed through various experiments conducted by R. P. Angiers, head of the psychological department.

I noticed about 20 or 25 minutes after taking the peyote a decided pressure or dull feeling at the top of my head. This remained with me throughout the day. I had occasional feelings of dizziness and a slight tendency at various times toward nausea. I, however, found that my brain seemed to be active and at periods very clear, but as the day went on I found slight lapses of memory occurring, or a lapse of mental control. I also found that I was somewhat shakey, finding it difficult to control my movements, especially in regard to my hands. I found that the eyes were affected, not being able to focus them quickly upon objects, especially those at a distance. I also felt quite feverish throughout the day and felt what resembled in a very slight form,

barely noticeable, chills running down my arms and limbs. At various times I had a consciousness of losing my mental control, so that I feared ~~that in conversation I might say things I did not intend to say.~~

While coming home on the train that evening I found that the noises of the train and the confusion caused by passengers coming in and going out did not disturb me as much as usual and that I could concentrate my mind upon the book I was reading very easily; in fact, I do not remember the passage from Bridgeport to New York distinctly, but was completely absorbed in my reading. I found, as we neared New York and I stopped reading, that my eyes smarted a great deal. This was possibly due to constant reading without intermission. It is usually my custom to rest my eyes at periods during my reading. I can not attribute this concentration to my reading being of intense interest, for I had been reading the same book for some time and had not found it such. I had a distinct feeling of hunger and entered a restaurant, ordering a heavy meal. I knew the place and had always enjoyed the coffee they served and their fresh eggs. I was greatly disappointed to find that nothing tasted good to me and that, while hungry, I did not especially enjoy the meal. I also felt a slight exhilaration which put me in a very optimistic mood, and I hastened to my room lest it might lead me to lose control of myself. Then in my room I planned to write a letter or two before retiring. I wrote several letters and found that I did not in the least care to go to sleep. It was long past midnight when I looked at my watch, having read all that time, so I took a bath and went to bed. However, I was exceedingly restless and as wide awake as anyone could be. I was not in the least worried about anything and felt in a very happy frame of mind. Along toward morning I succeeded in going to sleep and found that I was exceedingly drowsy and rather debilitated during the following day. As usual I had the windows open and the room was very cool, a fresh draft blowing through the room the entire night, but I was exceedingly warm all night, as much so as if I had a fever, and I found that just the slightest covering seemed to be all I needed.

It was especially noticeable during my writing all the evening that I could not control my hand so as to write smoothly and evenly. In one instance I had to address an envelope four times before it looked right to me. Another peculiar thing was that I seemed to have lapses of memory and had to stop in the middle of a sentence, having forgotten what I had intended to say, but these lapses did not last more than a few seconds, and then my mind was as clear as usual.

ROBERT D. HALL.

On this 10th day of November, in the year 1911, there appeared before me Robert D. Hall, of 124 East Twenty-eighth Street, New York, who being known to me, being by me duly sworn, says that he resides in the city of New York, and that on the 5th day of November he went to Yale University, at New Haven, Conn., where, on the 6th day of November, he took some peyote for purposes of experimentation, under the direction of R. P. Angiers, head of the psychological department of Yale University, and that the above statement subscribed to by me is an accurate and truthful statement of his personal feelings during the time he was under the influence of this peyote.

CHAS. E. LYMAN,

Notary Public, Richmond County.

Certificate filed in New York County clerk's office, New York County. (Register's certificate 3146.)

Yale University,
Psychological Laboratory,
New Haven, Conn., January 10, 1912.

My dear Mr. Hall:

In accordance with my note to you of two days ago I herewith submit a report on the results of our experiments together to determine the influence of the peyote on your mental processes. As I wrote you then, these experiments were designed to be exploratory rather than final. Some of them gave no definite results whatever. I am including only those which warrant definite conclusions, and even these are not based upon as many experiments of each given type as I could wish. I am, therefore, using them as indications and hints for the devising of future experiments rather than as final conclusions. Even in their tentative form, however, they show, taken as a whole, that peyote is deleterious in its influence, even in the small doses which you took. I have little doubt that in large doses the influence would be worse. I am appending on the last sheet of this report the records of your taking of the peyote, together with your comments on your feelings under its influence.

These preliminary tests, as you may remember, were taken from Whipple's "Manual of Mental and Physical Tests," published in 1910 by Warwick & York, Baltimore. In each case I am giving the number of the test in Whipple, so that if you wish to refresh your memory on the exact nature of each test you may consult him.

The first series of tests was designed to get some insight into your ability to control the movement of certain coordinated systems of muscles of your body under the influence of peyote.

Test No. 11. Accuracy of movement.-- The test consisted of an attempt on your part to strike with the point of a pencil, by thrusting out your arm from the shoulders at full length, the centers of a series of ten crosses, drawn in ink on the wall, in succession, three attempts being made with each cross, both with and without peyote, making a total of 30 such thrusts. Without the peyote your average error for these 30 thrusts was 4.8 millimeters, and with the peyote, 9.4 millimeters. Your errors under the influence of peyote were therefore about double in extent those without it.

Test No. 12. Steadiness and precision of movement.-- The test consisted in trying to pass a brass rod vertically downward between two other brass rods which stood upright on the table. The distances between the two upright rods were varied from 4 to 8 millimeters. Each time the brass rod which you were passing downward between the uprights came in contact with either of these an electric circuit was closed, which, by means of an appropriate marker, made a line on the smoked paper of a revolving drum. The number of contacts serves thus as an index for the steadiness of your movements, the steadiness varying in inverse proportion to the number of contacts. Without peyote the total number of contacts made in four such attempts was 122; with the peyote, 238. Your steadiness of movement under the influence of peyote was, therefore, about 80 per cent poorer than without it.

Test No. 13. Steadiness of movement.-- The aim of this was similar to the preceding. The requirement was to hold a brass rod, less than a millimeter in diameter, in the centers of a series of circular holes punched in a brass plate, standing vertically on the table. You were told to hold the rod in each one of those openings, which varied in diameter from 6 to $3\frac{1}{2}$ millimeters, without touching the edges. Each time the rod which you held came in contact with the edge of the hole an electrical connection made a corresponding mark on smoked paper, as in the preceding experiment. Without peyote there were 134 such contacts in five such experiments; with the peyote, 162 contacts. Your steadiness was therefore, under the influence of peyote, about 21 per cent less than with it.

These three types of experiments for testing motor control yield, therefore, a rather unequivocal result, showing that the steadiness and accuracy of coordinated movements suffers considerably under the influence of peyote. The significance of this lack of motor control for people who take larger doses of peyote, and are at the same time under the influence of strong emotional excitement, seems rather obvious.

The next series of experiments concerns your ability to control your attention and perception.

Test No. 25. Visual Apprehension.-- In this test 20 different objects, such as a knife, letter scales, piece of sealing wax, etc., were spread out upon a table in irregular position. You were allowed to view these objects for 10 seconds, at the end of which period you turned your back on them and repeated to me aloud the names of as many of the objects as you remembered. The results were that, without peyote, you remembered 12 such objects, and with peyote, 6. The objects shown you in the two different tests, with and without peyote, respectively, were all different. Although it would be premature to base a final conclusion on these two experiments, it seems fair to say that your field of visual perception and your ability to retain in memory the images of objects seen is narrowed under the influence of peyote.

Test No. 27. Accuracy and Concentration of Attention.-- The test here was to count aloud, in any way that you wished series of black dots, each series arranged in a horizontal row on white paper, the distance between the dots and the total number of dots in each row varying. In all, 27 such different rows were counted. Without peyote your average time for counting each row was 12.7 seconds; with peyote 16.5. The number of errors made was, without peyote, 116, and with peyote, 125. It is perhaps fair to conclude from this that active and efficient concentration of the attention suffers under the influence of peyote.

The next series of tests which produced certain results were those on the association of mental activities and on memory. The chief test was one in adding series of printed digits, arranged in vertical rows of 10 each. You were asked to add as many of these as you could in the time given you as accurately as possible, recording the sum at the end of every 10 figures added. Without peyote you kept this up uninterruptedly for 52 minutes. In all, you had added 2,232 figures in this time, giving an average number of figures added per minute of 42.9. Under the influence of peyote, you kept up this adding process on different rows of figures for 30 minutes, adding in that time 1,055 figures, giving an average of 35.2 figures added per minute. As compared with the

prolonged concentration of attention and accuracy of mental operations, this is one of the best that we have. I think it shows clearly that under the influence of peyote the speed of activity suffers considerably, showing undoubtedly that your attention fatigues easily. The higher average attending without peyote is indeed more significant than the figures indicate, since the test was given for 52 minutes, as against 30 minutes when under the influence of peyote. One would expect, therefore, greater fatigue to show in the longer test, but the average number of figures added per minute is greater.

Test No. 39. Memory of Ideas. -- In this experiment a passage of prose, containing in all 166 words and 67 different ideas, was read aloud to you. You were then asked to reproduce as completely as possible this passage, attempting to give, not all the words, but all the ideas. Under the influence of peyote a similar passage, containing 181 words and 91 ideas, was read and reproduced. Without peyote, you omitted 37 per cent of the total number of ideas; with peyote, you omitted in your reproduction 46 per cent.

All these experiments taken together seem to me to indicate, at least, that under the influence of peyote your control over your movements, that is, over the motor coordination of your muscles, suffers; that your power of attention is not so great and fatigues more readily than when you are not under the influence of the drug. Furthermore, it appears that your range of apprehension and memory also suffer. In short, even with the small doses of the drug which you took, your general "efficiency" was certainly lessened. There was an indication also, running all through the experiment, that you tended to work with a sort of superficial haste, under the influence of peyote. If such preliminary experiments, when made more thorough, should show similar results, it would be fair to conclude, I think, that anyone under the influence of large quantities of this drug and suffering at the same time from strong emotional excitement would tend to lose the ordinary inhibitions on his impulsive activity that proceed from due reflection and yield in a haphazard way to his emotions. Before, however, any conclusion such as this could be definitely final, it would be necessary to amplify the experiments.

Yours, very truly,

ROSWELL P. ANGER.

MR. ROBERT D. HALL,
124 East Twenty-eighth Street,
New York City.